GROUND-LEVEL OZONE

TRENDS IN OZONE CONCENTRATIONS

Nationally, ozone concentrations were 5 percent lower in 2007 than in 2001, as shown in Figure 7. The trend showed a notable decline after 2002. Though concentrations in 2007 were among the lowest since 2002, many areas measured concentrations above the 2008 national air quality standard for ozone (0.075 ppm). When comparing two 3-year periods, 2001-2003 and 2005-2007, 97 percent of the sites show a decline or little change in ozone concentrations as shown in Figure 8. The sites that showed the greatest improvement were in or near the following metropolitan areas: Cleveland, Ohio; parts of Houston, Texas; Fresno, Calif.; and Chambersburg, Pa. However, other parts of Houston also showed a notable increase.

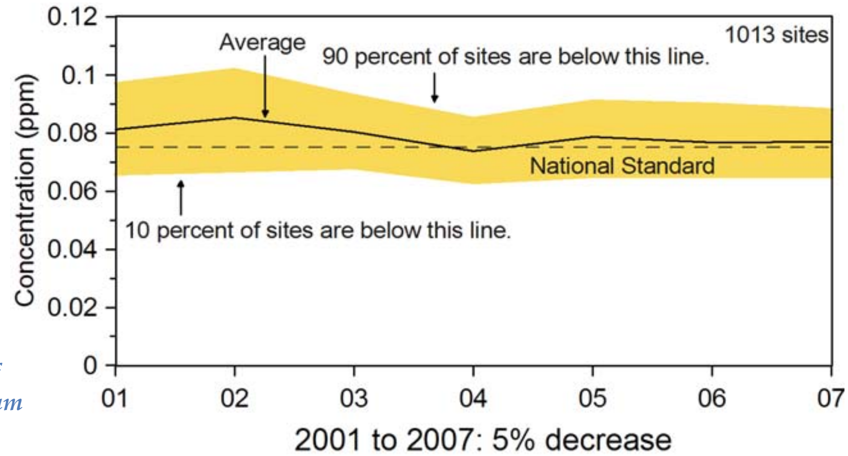


Figure 7. National 8-hour ozone air quality trend, 2001-2007 (average of annual fourth highest daily maximum 8-hour concentrations).

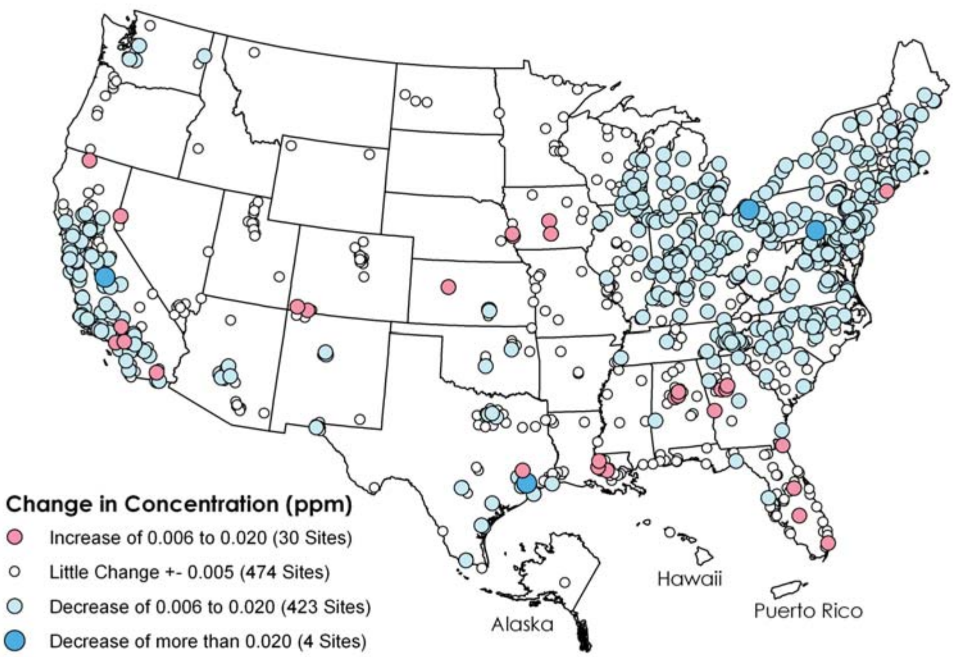
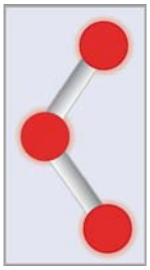


Figure 8. Change in ozone concentrations in ppm, 2001-2003 vs. 2005-2007 (3-year average of annual fourth highest daily maximum 8-hour concentrations).

Thirty sites showed an increase of greater than 0.005 ppm. Of the 30 sites that showed an increase, 12 had air quality concentrations below the level of the 2008 ozone standard for the most recent year of data, 2007. The remaining 18 sites with concentrations



EPA Strengthens Ground-level Ozone Standards

On March 12, 2008, EPA strengthened the primary and secondary National Ambient Air Quality Standards for 8-hour ozone to 0.075 ppm. The new standards are tighter than the previous level of 0.08 ppm (effectively 0.084 ppm). The new standards will improve both public health protection and the protection of sensitive trees and plants. Improved health protection includes preventing cases of reduced lung function and respiratory symptoms, acute bronchitis, aggravated asthma, doctor visits, emergency department visits and hospital admissions for individuals with respiratory disease, and premature death in people with heart and lung disease. The Air Quality Index (AQI) breakpoints were changed to reflect the new primary standard. The new 100 AQI level for 8-hour ozone is 0.075 ppm. Information on the AQI can be found at http://www.airnow.gov.

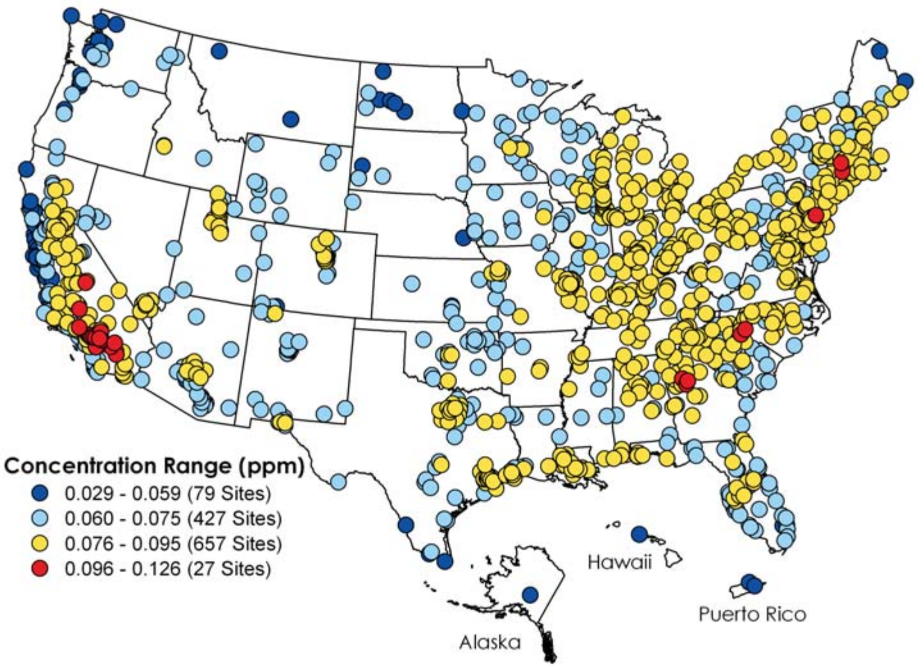


Figure 9. Ozone concentrations in ppm, 2007 (fourth highest daily maximum 8-hour concentration).

above the new ozone standard in 2007 were located in or near the following metropolitan areas: Birmingham, Ala.; El Centro, Calif.; Los Angeles, Calif.; Jacksonville, Fla.; Orlando, Fla.; Columbus, Ga.; Atlanta, Ga.; Baton Rouge, La.; New York, N.Y.; and Houston, Texas. Ozone trends can vary locally, as shown by the presence of increases and decreases at nearby sites.

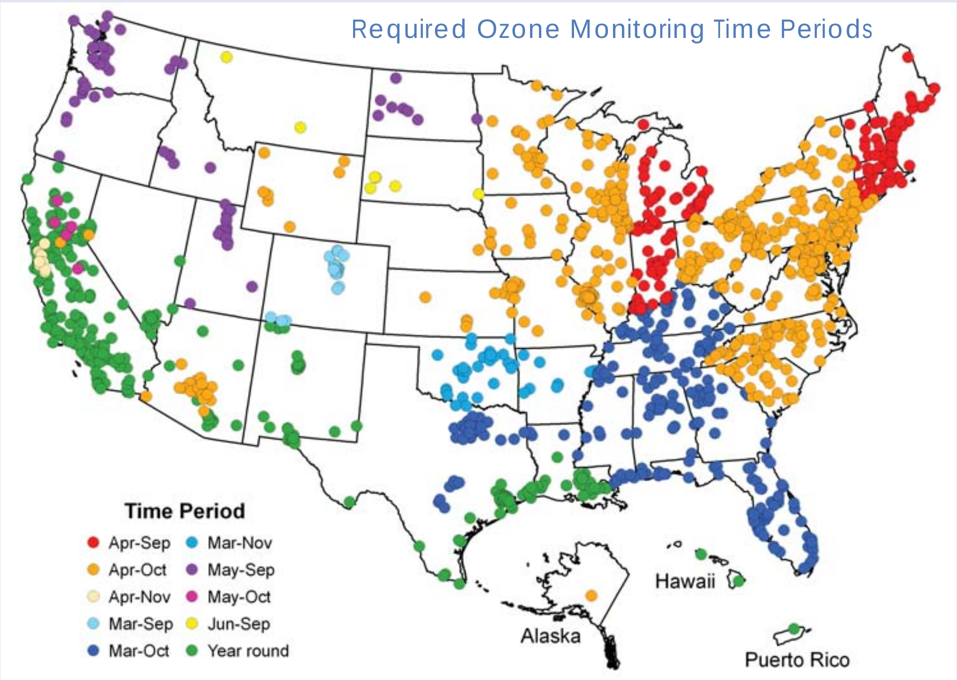
Figure 9 shows a snapshot of ozone concentrations in 2007. The highest ozone concentrations were located in California, Connecticut, Georgia, Massachusetts, North Carolina, and Pennsylvania. Fifty-seven percent of the sites were above 0.075 ppm, the level of the 2008 standard.

EPA Reviews Ozone Monitoring Requirements

EPA is currently reviewing the requirements for ozone monitoring by state and local air agencies. At present, there are about 1200 ozone monitors in operation, mostly in cities with population over 350,000. EPA is reviewing the following aspects of the ozone monitoring program:

- The number of monitors required in smaller cities.
- The number and location of monitors required in rural areas, especially near parks and protected areas.
- The number of months of the year when ozone data must be collected and recorded.

High concentrations of ozone typically occur during months with warm temperatures and strong sunlight. Therefore, year-round monitoring has not been required except in certain areas (see map). Some states monitor in additional months on a voluntary basis. EPA is considering extending the currently required monitoring seasons in light of the new ozone standard level of 0.075 ppm. Data collected during additional months may be necessary to alert the public of all unhealthy days and correctly identify nonattainment areas. For example, 26 of 35 states that are not required to monitor ozone in March do so voluntarily, and in recent years they have measured ozone at unhealthy levels. Similar unhealthy levels may be happening in states not monitoring ozone in March.



WEATHER CONDITIONS INFLUENCE OZONE

In addition to emissions, weather also plays an important role in the formation of ozone. A large number of hot, dry days can lead to higher ozone levels in any given year, even if ozone-forming emissions do not increase. To better understand how ozone is changing, EPA assesses both the changes in emissions as well as weather conditions. EPA uses a statistical model to calculate a weather adjustment factor that estimates the influence of atypical weather on ozone formation. The adjustment factor is derived from using weather variables such as temperature and humidity. This provides a clearer picture of the underlying pollutant trend from year to year, making it easier to see the effect of changes in emissions on air quality. Geographic differences in the weather adjustment factor for 2007 are shown in Figure 10. In 2007, weather contributed to higher than expected ozone formation in the East, as indicated by values greater than 0.005 ppm.

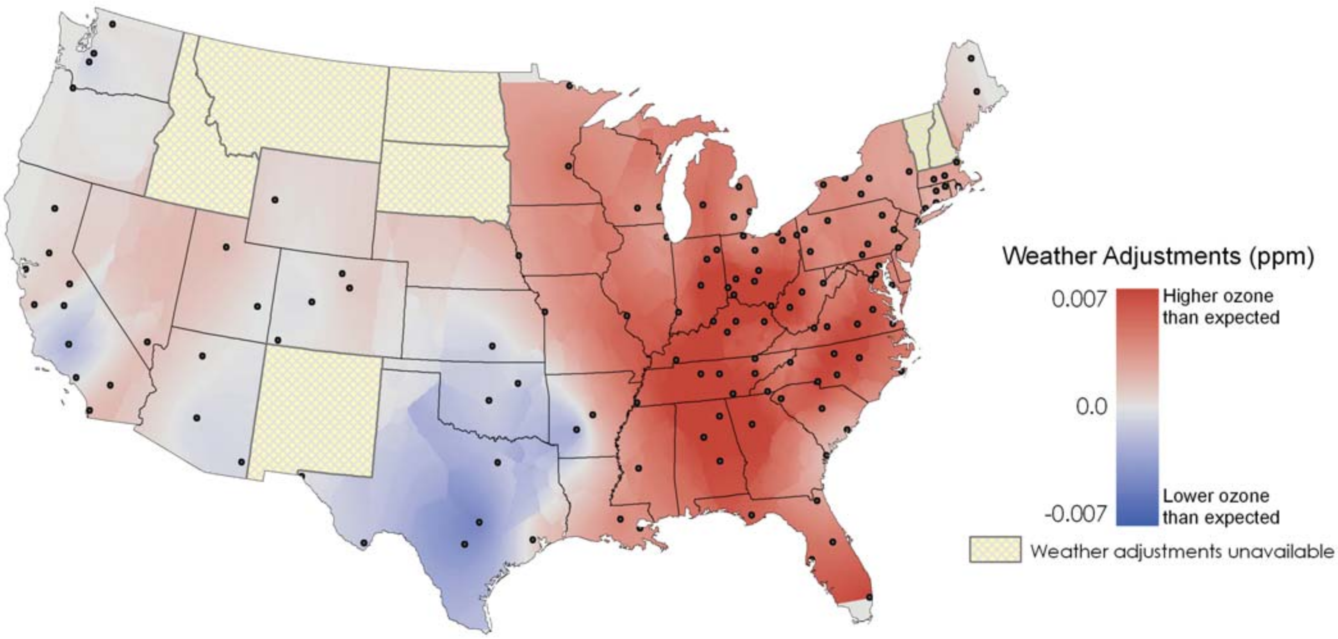


Figure 10. Difference between 2007 observed and adjusted ozone concentrations (average daily maximum 8-hour ozone for May-September). The map shows areas where weather contributed to higher or lower ozone concentrations than expected. Estimated changes for locations farther from monitoring sites (dots on map) have the largest uncertainty.

Note: For information on the statistical model, read "The effects of meteorology on ozone in urban areas and their use in assessing ozone trends," by Louise Camalier, William Cox, and Pat Dolwick of the U.S. EPA. *Atmospheric Environment* **41**, Pages 7127-7137, 2007.

Figure 11 shows ozone trends for 2001 through 2007, averaged across selected sites before and after adjusting for weather. At the national level, observed ozone levels show a very small decrease of one percent between 2001 and 2007 compared with a larger decrease of eight percent after removing the influence of weather. By examining the data separately for California vs. eastern U.S., it is clear that the majority of the ozone improvement, after adjusting for weather, occurs in the East (on the order of 10 percent).

The largest change in observed and weather adjusted ozone in the East occurred during the period from 2002 through 2004, and was especially noticeable between 2003 and 2004. This relatively abrupt change in ozone levels coincides with the large oxides of nitrogen (NO_x) emissions reductions brought about from implementation of the NO_x SIP Call rule, which began in 2003 and 2004. This significant improvement in ozone continues into 2007, i.e., weather-adjusted levels in 2007 are the lowest over the 7-year period.

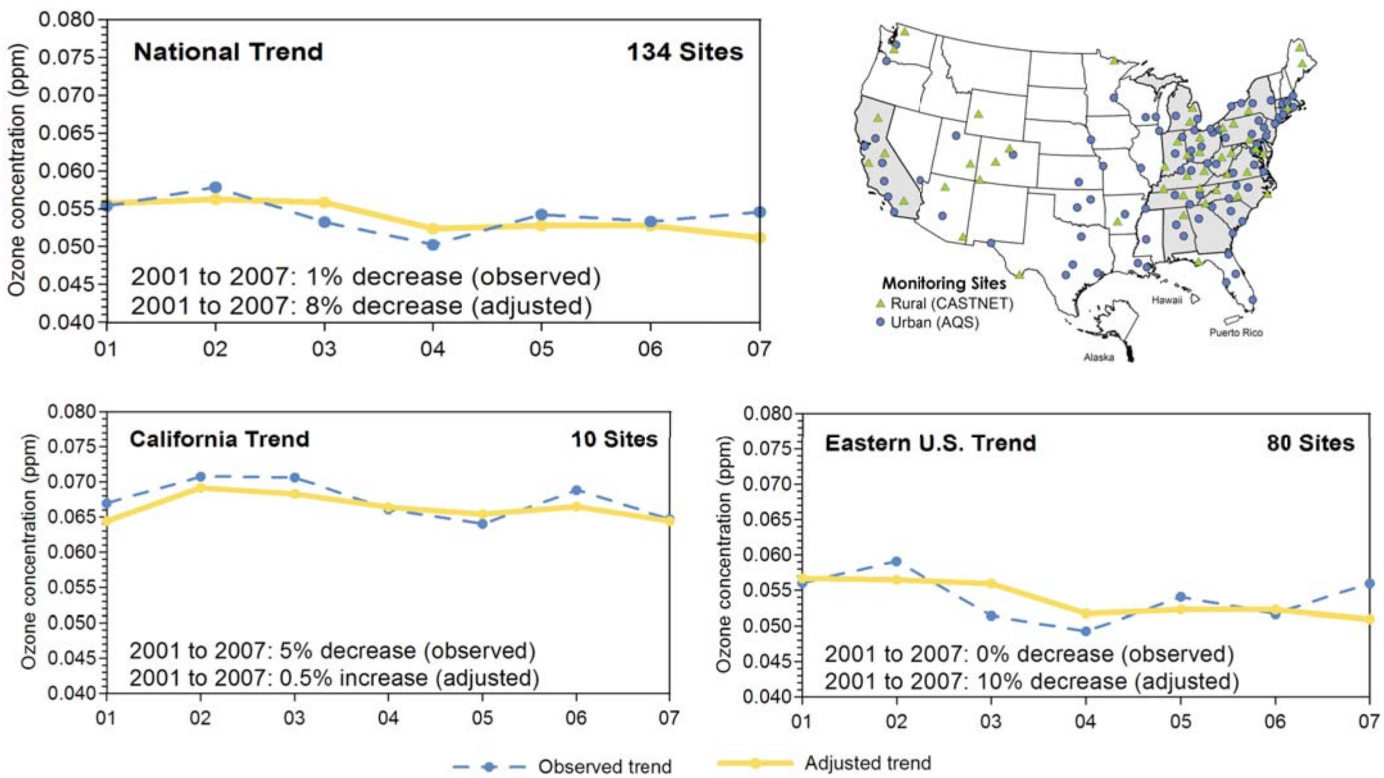


Figure 11. Trends in average summertime daily maximum 8-hour ozone concentrations (May-September), before and after adjusting for weather nationally, in California and in eastern states; and the location of urban and rural monitoring sites used in the averages.

Notes: Urban areas are represented by multiple monitoring sites. Rural areas are represented by a single monitoring site. For more information about the Air Quality System (AQS), visit http://www.epa.gov/ttn/airs/airsaqs. For more information about the Clean Air Status and Trends Network (CASTNET), visit http://www.epa.gov/castnet/.

Air Quality Where You Live

EPA has several Web sites to help answer frequently asked questions regarding local air quality. To see air quality trends for an individual area, visit the AirTrends Where You Live page at http://www.epa.gov/airtrends/where.html. Local trends are available at individual monitoring locations for pollutants monitored there.

To get air quality information to compare different areas of the country, visit AirCompare at http://www.epa.gov/aircompare. Select up to 10 counties across the country and find out how many days in each county the air was unhealthy last year for a specific health concern (e.g., asthma). Also find out which are the worst months. The example below shows a comparison of seven counties near Atlanta, Ga.